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AUTHOR Rumain, Barbara; Braine, Martin D. S.
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ABSTRACT

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How Do Children Understand the Focus of Negation?

Barbara Rumain

Albert Einstein College of Medicine

and

Martin D. S. Braine

New York University

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How Do Children Understand the Focus of Negation?

Abstract

The focus assigned to sentential negatives is investigated in seven- and ten-year-olds and adults. Two cues are considered as pragmatic indicators of the sentence component(s) to which the negative operator is applied. One is the articles; it is proposed that an indefinite noun phrase is taken within the scope of a negative and a definite noun phrase outside it. A second cue is position. Based on Jackendoff's and Hornby's work, subjects may be expected to take the second noun within the focus of a sentential negative regardless of the articles. The present study sampled a larger variety of sentence structures than did de Boysson-Bardies. Additionally, a multiplicity of experimental techniques was used. In Experiments 1 and 2 subjects made picture selections for sentences of the form A Noun1 isn't V-ing the Noun2, The Noun1 isn't V-ing a Noun2, and their passives. In Experiment 3, ten-year-olds described the scenes of the sentences of the prior experiments. It was found that position was used as a cue by all age groups. Also, all age groups took the indefinite article within the scope of the negative with the effect being strongest in the adults and weakest in the seven-year-olds. Developmental differences in the use of the articles are related to the development of mastery of these linguistic markers.

The purpose of the present work is to investigate how people understand negative sentences, in particular what aspects of the sentence are negated and to examine the development of this understanding with age. For instance, in the sentence John does not eat bread, is the focus of the negative operator John (viz., It is not John but Anthony (say) who eats bread) or is it bread (viz., It is not bread that John eats but something else (say meat)) or is it eat (viz., John does not eat bread; he does something else with it)?

Some surface features of a sentence probably act as cues as to which component of a negative sentence is the focus of the negation. One such cue is the articles present. A function of the articles is to indicate givenness or newness: an indefinite noun phrase introduces a previously unidentified referent into the discourse (Vendler, 1967); thereafter, a definite noun phrase is used to refer to the already identified referent. Consider the two negative sentences,

(1) Ann is not renting the van.

(2) Ann is not renting a van.

The negative operator in (2) seems quite naturally to apply to van, the "new" component in the sentence, so that (2) may very well be given the interpretation (for example)

(3) Ann isn't renting a van; she's renting a car.

However, in (1) where van is the "given," the negative most naturally applies to the verb as in

(4) Ann isn't renting the van; she owns it.

Thus, it seems that a pragmatic indicator of the component of the sentence to which the negative operator applies should be the articles in the sentence. Since the noun following a definite article has been already referenced, one would expect it to be taken outside the focus of the negation, and one

would expect a noun following an indefinite article to be taken within the focus.

Another possible cue for the assignment of the negative operator is the position of the nouns in the sentence. Jackendoff (1969) proposes that the scope of the negative operator is what follows it. This would mean that for any negative sentence N_1 neg V N_2, where N_1 is the first-occurring noun in the sentence and N_2 the second-occurring one, we might expect people to apply the negative to N_2, to V, or to VN_2 (i.e., to the verb phrase as a whole, e.g., Ann is not renting a van; she's doing her income tax); but we would not expect them to apply it to N_1. Hornby (1971) distinguishes between the topic and comment in a sentence with the "topic" being "the part of the sentence which constitutes what the speaker is talking about" (p. 1976) and the comment being the rest of the sentence. The topic of ordinary actives and passives is the first noun of the sentence. Though Hornby's study contained no negatives, the findings he obtained suggest that for such types of sentences individuals might leave the topic intact and apply the negative operator to the comment. Presumably, it is the givenness of the topic that marks it as important. Hornby's analysis and that of Jackendoff are complementary rather than competitive. Under both, individuals utilize the cue of position for ordinary sentences; they maintain the noun preceding the negation as is and apply the negative operator to some other element(s). The work of Johnson-Laird (1969a,b) also suggests that position is used as a cue to the scope of logical elements, specifically quantifiers.

De Boysson-Bardies (1977) looked at a limited aspect of the interaction of negation with articles; however, the present study samples a larger variety of sentence structures than de Boysson-Bardies did. Further, the drawing task she used may have induced the children to keep the pictures simplistic.

This possibility is eliminated by the tasks used here.

EXPERIMENT 1

The purpose of this experiment was to determine whether the articles and/or position of the noun are used by subjects as cues to situate negative utterances within their pragmatic context, and whether there are age differences. To the extent that there is an article effect, one would expect subjects to take an indefinite article within the focus of a negation. For example, they should interpret the active sentence A man isn't driving the car as neg-(man) is driving the car. And, when presented with two pictures, one of a woman driving a car and the other of a man driving a truck, they should choose the former as best described by the sentence.

On the other hand, if subjects are operating strictly according to the position cue, they should select a picture which maintains the first-occurring noun regardless of the form or voice of the sentence. So, for A man isn't driving the car, subjects would be predicted to select the picture of the man driving a truck. Subjects may use both the article and position cue. In A...the... sentences the two cues work against each other, with the article cue calling for a picture selection which changes N_1, and the position cue calling for a change in N_2, as in the example above. In The...a... sentences both cues work in the same direction: They call for applying the negative operator to N_2, leading to a picture choice in which N_2 is changed. As an illustration, in the active sentence The man isn't driving a car, both cues call for selecting the picture in which N_2 is changed, viz., that of a man driving a truck. For the passive The car isn't being driven by a man, both cues lead to selection of the picture in which a woman is driving a car.

The decision of what types of sentences to include in the study was guided by the need to make certain that it was the articles and no other

features of the sentences that were determining subjects' picture selections. Since the actor might have a special prominence in a sentence simply because of its role as an actor, it was thought that subjects might make picture selections in which the actor was always maintained in the sentence regardless of the articles present. If they used such a strategy, which shall be referred to as an "actor strategy," they would leave the first noun (N_1) in the picture for active sentences and the second noun (N_2) in the picture for passives (since in an active sentence the actor is the first noun and in a passive sentence it is the second noun). Thus both active and passive sentences were included to determine if such a strategy was being employed. Animacy of agent and object was varied to determine whether animacy affected picture selection since it seemed conceivable that subjects would see an animate noun as having greater importance and might be reluctant to apply the negative operator to it even if an indefinite article preceded it. In all, eight sentence types were used. Half of these were active and half were passive. In one of the actives and one of the passives, both nouns were animate; in another, both nouns were inanimate; in the third, the first noun was animate and the second inanimate; in the fourth, the first noun was animate and the second noun inanimate.

Method

Child subjects were 20 seven-year-olds, with a mean of 7-1 (years-months) and 28 ten-year-olds, with a mean of 10-6. There were 20 adults who were college students.

Each subjects was presented with 16 sentences. There were four sentences in each of the following four forms:

(i) The...a...(Active): The N_1 isn't V-ing a N_2 (e.g., The dog isn't carrying a frog.)

(ii) The...a...(Passive): The N_1 isn't being V-ed by a N_2 (e.g., The frog isn't being carried by a dog.)

(iii) A...the...(Active): A N_1 isn't V-ing the N_2 (e.g., A dog isn't carrying the frog).

(iv) A...the...(Passive): A N_1 isn't being V-ed by the N_2 (e.g., A frog isn't being carried by the dog).

Each of the four sentence forms occurred in four animacy conditions. The four animacy conditions were N_1 animate, N_2 inanimate (An-In); N_1 inanimate, N_2 animate (In-An); N_1 animate, N_2 animate (An-An); N_1 inanimate, N_2 inanimate (In-In).

For each of the 16 sentence types, content was rotated across subjects so that, for instance, for one quarter of the subjects the The...a...(Active)(An-In) sentence was represented by The bear isn't reading a book, for another quarter of the subjects by The man isn't washing a truck, for a third quarter by The mouse isn't eating an ice cream cone, and for the remaining subjects by The rabbit isn't holding an apple. In all, there were 16 types of sentence content (e.g., man/washing/truck, baby carriage/hitting/rabbit, dog/carrying/frog, etc.). And, any particular content appeared in each of the four sentence forms for one quarter of the subjects. Thus, the content man/washing/truck was assigned to The...a...(Active) for a quarter of the subjects, to The...a...(Passive) for a quarter of the subjects (e.g., The truck isn't being washed by a man), to A...the...(Active) for a quarter (e.g., A man isn't washing the truck),and to A...the...(Passive) for the remaining quarter. A similar rotation was performed for the other animacy types.

A pair of pictures was designed for each content type so that in one, N_1 an the verb of the associated negative sentence were maintained but N_2 was altered, and in the other, the verb and N_2 were maintained but N_1 was

altered. For instance, for the content type man/washing/truck, one picture depicted a woman washing a truck, and the other a man washing a car.

The task was picture selection one. Subjects were read a sentence (e.g., A man isn't washing the truck) and selected the picture which best illustrated the sentence. See the illustration on the following page.

Results and Discussion

An analysis of variance was performed on the number of picture selections in which N_1 was changed. The analysis was a four-way analysis with repeated measures on the first three factors. The factors were article (2 levels: a-the, the-a), voice (2 levels: active, passive), animacy (4 levels: In-An, An-In, An-An, In-In) and age (3 levels). It was found that there was a significant effect of age ($F(2,65) = 4.569$), $p < .05$, a significant article effect ($F(1,65) = 69.450$, $p < .001$), a significant age x article interaction ($F(2,65) = 5.105$, $p < .001$), and a significant age x voice interaction ($F(2,65) = 3.966$, $p < .05$). There was no significant main effect of animacy or voice, nor were any of the remaining interactions significant, either.

Table 1 gives the mean number of picture selections per subject that were changes in N_1 as a function of voice for each age group. (Each subject's score could be just 0 or 1. As an example, for the sentence The cat isn't being hugged by a girl, the selection of the picture showing a dog hugged by a girl would be a response in which N_1 was changed and would receive a score of 1 for N_1 changes.) The article effect was as predicted with subjects of all ages making more N_1 changes on A...the... than on The...a... sentence forms. For the age effect, comparisons indicated the significant difference to be between the seven- and ten-year-olds with the seven-year-olds making significantly more N_1 changes than the ten-year-olds ($F(1,65) = 8.956$, $p < .01$)

A MAN ISN'T WASHING THE TRUCK

ΔN_1

ΔN_2

and no significant difference in the number of N_1 changes between the ten-year-olds and the adults. These findings have to do with preferences for changing N_2, the difference with age in the position effect discussed below.

The age x article interaction was expected. It reflects the tendency with increasing age for individuals to make increasingly more picture selections in accordance with the article effect; they make more N_1 changes on A...the... sentence forms and fewer N_1 changes on The...a... forms. Thus, with increasing age, there is an increasing responsiveness to the linguistic markers a and the as cues to the focus of negation. The age x voice interaction reflects relatively more N_1 changes on passives in seven-year-olds and relatively fewer in the adults.

In order to determine whether an article effect was present in each group individually and to explore further the source of the age x article interaction, separate 2 x 2 x 4 analyses of variance with repeated measures on all three factors (article, voice, animacy) were carried out at each age level. And, indeed, a significant article effect was demonstrated at each age (for the seven-year-olds, $F(1,19) = 4.41$, $p < .05$; for the ten-year-olds, $F(1,27) = 14.21$, $p < .001$; for the adults, $F(1,19) = 60.07$, $p < .001$). Additionally, in both the adults and the seven-year-old analyses, a significant main effect of voice was found. Adults made more N_1 changes on actives than on passives, although the F-value just barely reached significance ($F(1,19) = 4.392$, $p < .05$). This finding for the adults seems uninterpretable since there is no apparent reason for there being more N_1 changes on actives than on passives; it may be a chance effect. Seven-year-olds made significantly more N_1 changes on passives than on actives ($F(1,19) = 6.229$, $p < .05$). This may be evidence for an influence of the role of the actor in sentence comprehension, a possibility mentioned earlier (p. 5): That is,

the seven-year-olds may be viewing the actor as the more important constituent and have a tendency to apply the negation to the object of the action. All of these voice effects seem weak relative to other effects.

Subjects operating strictly according to the article effect would always change N_2 on The...a... sentences and change N_1 on A...the... sentences. Whereas nearly all the adults (94%) change N_2 on the former type of sentence, only a majority of them (63%) change N_1 on the latter type. This drop in the percentage of subjects acting according to an article effect indicates a tendency to change N_2 regardless of the articles. It is a measure of the "position effect." In The...a... sentence forms, both effects work in the same direction and require that the negative operator be applied to N_2. In A...the... sentence forms, while the article effect calls for applying the negation to N_1, the position effect calls for applying it to N_2, leading to the drop in the percentage of subjects operating according to an article effect.

If there were no position effect, one would expect N_2 to be changed for half the sentences (i.e., 8 times in the 16 opportunities). In order to test the significance of the position effect we compare the total number of picture selections in which N_2 is changed to the expected number of 8. Doing this, we find the position effect is significant at all ages (for the adults, $t(19) = 5.926$, $p < .001$; for the ten-year-olds, $t(27) = 7.053$, $p < .01$; for the seven-year-olds, $t(19) = 2.902$, $p < .01$. The mean number of N_2 changes for each age group are as follow: Adults, 10.45; ten-year-olds, 11.11; seven-year-olds, 9.30. Thus, the position effect peaks in the ten-year-olds. A significant difference with age in the position effect was indicated by a one-way completely randomized analysis of variance for the number of N_2 changes where the factor was age, ($F(2,66) = 4.383$, $p < .05$). Planned comparisons indicated a significant jump in the position effect between seven and ten years ($F(1,66) = 8.73$, $p < .01$). The decrease between ten years and adulthood is not

significant.

It is possible to quantify the effects of the article cue and the position cue in each of the age groups of Table 1. Let A be the probability that position contributes to the response choice, and $P(N_2)$ be the probability of selecting the picture that changes N_2. Then for The...a... sentence forms, the two effects are working in the same direction and we can write

$$P(N_2)_{The\text{-}a} = A + P - AP + \tfrac{1}{2}(1 - (A + P - AP)) \qquad (8)$$

If the only factors operating were the article and position cues, and since they both work in the same direction, the probability that subjects would choose the picture changing N_2 would equal to the probability that the article cue is operative plus the probability that the position cue is operative minus the probability that both cues are operative; or symbolically, A + P -AP. These are the first three terms of equation (8). However, if noise dominates (e.g., subjects are guessing) then neither cue is utilized. One can represent all such cases of noise by 1 - (A + P - AP). It is expected that in half of these cases subjects will select N_1 and in half they will select N_2. Thus, $\tfrac{1}{2}(1 - (A + P - AP))$ contributes to $P(N_2)$ whence the third term of equation (8). Algebraically, equation (8) reduces to

$$P(N_2)_{The\text{-}a} = \tfrac{1}{2}(A + P - AP + 1). \qquad (8')$$

For A...the... sentence forms, the position effect calls for a change in N_2 but the article effect does not. If only these two effects were operating, the probability of choosing N_1 here is A(1 - P) and the probability of choosing N_2 is P(1 - A). All other cases may be represented by 1 - (A(1 - P) + P(1 - A)). Again, in half of these cases we expect subjects to choose N_1 and in half to choose N_2. Thus, we can write

$$P(N_2)_{A\text{-}the} = P(1 - A) + \tfrac{1}{2}(1 - A(1 - P) - P(1 - A)). \qquad (9)$$

Since both the article effect and the position effect are working in opposite directions for A...the... forms, the probability of both A and P occurring is nil. Therefore, such a term does not appear in the equation. By appropriate

algebraic manipulations, equation (9) becomes

$$P(N_2)_{A\text{-}the} = \tfrac{1}{2}(P - A + 1). \qquad (9')$$

From Table 2, we can substitute in the values for $P(N_2)$ for each group. For the adults:

$$P(N_2)_{The\text{-}a} = .94 = \tfrac{1}{2}(A + P - AP + 1)$$

$$P(N_2)_{A\text{-}the} = .37 = \tfrac{1}{2}(P - A + 1).$$

Solving, we get P = .50, A = .76. The guessing factor for The...a... sentences, $\tfrac{1}{2}(1 - (A + P - AP))$, works out to .06. The guessing factor for A...the... sentences, $\tfrac{1}{2}(1 - A(1 - P) - P(1 - A))$, works out to .25. For the ten-year-olds:

$$P(N_2)_{The\text{-}a} = .80 = \tfrac{1}{2}(A + P - AP + 1)$$

$$P(N_2)_{A\text{-}the} = .59 = \tfrac{1}{2}(P - A + 1).$$

Solving, A = .27, P = .45. The guessing factors are .20 for The...a... sentences and .26 for A...the... sentences. For the seven-year-olds:

$$P(N_2)_{The\text{-}a} = .64 = \tfrac{1}{2}(A + P - AP + 1)$$

$$P(N_2)_{A\text{-}the} = .52 = \tfrac{1}{2}(P - A + 1)$$

Solving, A = .12, P = .17. The guessing factors are .365 for The...a... sentence forms and .375 for A...the... sentence forms.

Thus, the contribution of the article effect at ten years is roughly twice what it is at seven years. Position is a stronger cue than the article in ten-year-olds but the reverse is true for adults. The major jump in the article effect occurs between ten years and adulthood and the major jump in the position effect between seven and ten years.

EXPERIMENT 2

Whereas in Experiment 1 the sentences were presented orally only, the sentences in Experiment 2 were written out and visually displayed (as well as presented orally) to a group of ten-year-olds so as to lessen attention and memory demands.

Subjects were twenty-four children from the fifth-grades of one

public and one private school in New York City, ranging in age from 9-8 to 11-6, with a mean of 10-5, years and months. Sentences were the same as those in Experiment 1 but each typed in capital type on an individual 3" x 5" white index card. Picture pairs were identical to those in the first experiment. The design was a replication of that in the first experiment. The procedure was as in Experiment 1 except that the sentences were displayed visually. In addition, instead of only the experimenter reading the sentence, the child first read it, and the experimenter then repeated it one or more times during the time interval that the child took to make a picture selection. The results replicated that of the first experiment.

EXPERIMENT 3

In Experiment 3 children were asked to describe what scenarios they would themselves generate for negative sentences. There were two reasons for doing this. The first was to see whether the results of the prior experiment could be obtained with a different method. In the previous two experiments subjects were presented with a forced choice between two pictures where only one component (agent or object) of these sentences was changed in each picture. In the present experiment subjects could construct descriptions of negative sentences in which the negative operator applied to and changed one or more components (agent, verb, object) of the sentence.

The second purpose of Experiment 3 was to provide a replication of de Boysson-Bardies' (1977) study with an improved method. De Boysson-Bardies asked her subjects to draw what was happening in a negative sentence. In the present experiment subjects were asked not to draw but to say what they would draw for the negative sentence; only a verbal description is required and drawing ability is inconsequential. In addition, a much broader sampling of sentences and sentence types was employed than in de Boysson-Bardies' work.

Method

Subjects. Sixteen ten-year-olds from one parochial and one public school in New York City participated. They ranged in age from 9-5 to 10-9 with a mean of 10-2, years and months.

Stimuli and Design. No pictures were used. The stimuli consisted of the 64 sentences of Experiments 1 and 2, each of which was typed on an index card. Each child received 16 of these since content was rotated as in Experiments 1 and 2. The design was identical to that in the first two experiments.

Procedure. Each child was seen individually. Experimenter placed the first of the sixteen index cards in front of the subject and said "Suppose someone said (INSERT SENTENCE 1) and asked you to draw what they were saying what would you draw?" The same procedure was followed for the remaining 15 index cards (sentences).

Results and Discussion

Subjects could apply the negative operator to one or more components of the sentence. Responses were categorized as to whether the negation was applied to the first noun of the sentence (ΔN_1), to the second noun (ΔN_2), to the verb (ΔV) or to some combination of these elements (viz., ΔN_1V, ΔVN_2).

An article effect makes the prediction that there will be more ΔN_1 and ΔN_1V type responses to A...the... than to The...a... sentence forms. A three-way analysis of variance with repeated measures on all three factors was performed. The three factors were article order (2 levels: a-the, the-a), voice (2 levels: active, passive) and animacy (4 levels: An-In, In-An, An-An, In-In). Each subject's score was the sum of his $\Delta N_1 + \Delta N_1V$ type responses. Thus scores are either 0 or 1. The prediction of an article effect was borne out, $F(1,15) = 5.907$, $p < .05$. No significant

main effect of voice was present nor of animacy, nor were there any significant interactions. A simialr analysis on $\Delta N_2 + \Delta VN_2$ responses gave the same results. Table 2 shows the percentage of responses for each response category when the data have been combined across animacy conditions.

There are two possible definitions of the position effect in this experiment. If we, like Jackendoff, take the position effect to be the application of the negative operator to whatever follows the negative in the sentence and measure it by summing $\Delta V + \Delta VN_2 + \Delta N_2$ responses, then it is evident from Table 2 that there is a huge position effect. Alternatively, Hornby's work can be used as the theoretical basis for the position efect and, as in the previous experiments, we can take the position effect to consist of just those responses that involve applying the negative operator to the second noun (i.e., responses that were N_2 and VN_2 changes). A measure of the effect can then be obtained by considering over all sentence forms whether subjects make more $\Delta VN_2 + \Delta N_2$ than $\Delta N_1 + \Delta N_1V$ responses. And, indeed, there are as indicated by a matched t-test, $t(15) = 3.271$, $p < .01$.

In sum, a significant article effect and position effect were demonstrated in ten-year-olds. This replicates the findings of Experiments 1 and 2. Furthermore, it was found that when children are given the opportunity to apply the negation to the verb of a sentence, they do so very often.

GENERAL DISCUSSION

The questions that motivated the experiments here were: What sentential cues do people use in their interpretation of negative sentences? And, are there any developmental changes with age in their use? Two potential cues were considered: articles and position.

The three experiments showed that in all age groups tested the articles

are used as pragmatic indicators of where the negation in a sentence should be applied, with a definite article being taken outside the focus of the negationand an indefinite article within it. The majordevelopment in the article effect takes place late: The effect is significant in all age groups but jumps markedly between ten years and adulthood.

Although the article effect was significant in the seven-year-olds, it was weakest in this group, with there being evidence for a tendency for the actor constituent to be protected from the focus of negation. It may be that seven-year-olds are as adept as older subjects in using the articles as cues to the focus of negation but that they have not yet developed mastery of the linguistic functions of the articles. While some functions of the articles are mastered by six years, e.g., the deictic function of the and the nominative function of a (Karmiloff-Smith, 1979), appreciation of the nonspecific reference function of a and of the anaphoric function of the are later-developing abilities (Karmiloff-Smith, 1979; Warden, 1976). One would expect that as mastery develops so would the article effect, and this is what we find. Karmiloff-Smith (1979) reports that it is not until adolescence that the definite article has linguistic antecedents, and in the present work it is in this age range that there is a significant growth in the article effect.

The experiments here demonstrated that the same article and position effects are obtained regardless of the technique. Also, in none of the experiments did animacy of agent and object play a signficant role in the interpretation given to the negative.

Let us consider the position effect. As noted earlier, the position effect denotes the subjects' tendency to maintain the first noun of the sentence in the picture selected or in the verbal description and to focus the negation on some portion of the sentence following the negative. Even

seven-year-olds use position as a cue for the focus of the negation and it might even be used at younger ages though this was not tested here. Two explanations for the position effect were offered. One derives from Jackendoff's (1969) work in which he asserts that the scope of the negative is what follows it (e.g., V, VN_2, or N_2). The second comes from Hornby's work with 6-10 year olds on topic-comment, viz., that children take the first part of the sentence to be the topic, the more essential component, and therefore apply the negation to the remaining part of the sentence. The increase in the position effect here between 7 and 10 years parallels Hornby's findings that sensitivity to topic and comment increases in this age range. Attention to topic and comment, and thus to position, is but another manifestation of an awareness of the given in a sentence (the topic) and of the new.

Let us compare the age trends here and those in de Boysson-Bardies' work. She found no significant difference in the article effect in the age groups studied (4-10 years). A significant article effect was demonstrated in all the age groups of Experiment 1 with no significant differences between the child groups. Thus, there are no inconsistencies in the age trends here and those reported by de Boysson-Bardies. Furthermore, de Boysson-Bardies did not test any adult subjects and had she done so, she may very well have obtained the jump in the article effect between ten years and adulthood that was found here.

The fact that both the position effect and article effect are significant in seven-year-olds means that even such young children are able to use not only the crude measure of position but also the finer measure of article structure as cues to the focus of negation. In later childhood there is still heavy reliance on position. In adulthood, once all the linguistic functions of

the articles have been mastered, the articles are relied on more heavily. It is probably in adolescence, once a complete awareness of all the linguistic functions of the articles develops (Karmiloff-Smith, 1979), that the articles begin to overtake position as a cue to the focus of negation.

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Table 1

Mean number N_1 changes per subject as a function of age in Experiment 1

(Data combined over animacy conditions)

	Adults	Ten years	Seven years
Sentence Form			
The N_1 ... a N_2 (Actives)	.25(6)	.78(20)	1.20(30)
The N_1 ... a N_2 (Passives)	.25(6)	.78(20)	1.70(43)
Total	.50	1.57	2.90
A N_1 ... the N_2 (Actives)	2.85(71)	1.51(38)	1.60(40)
A N_1 ... the N_2 (Passives)	2.20(55)	1.75(44)	2.20(55)
Total	5.05	3.26	3.80

Note. Maximum mean for each cell = 4.0. The numbers in parentheses indicate the percentage of responses that were changes in N_1.

Table 2

Percentage of responses conforming to selected response patterns by sentence form in Experiment 3

Sentence Form	ΔN_2	ΔVN_2	ΔV	ΔN_1	$\Delta N_1 V$	other
The N_1 ... a N_2 (Actives)	42	5	42	9	0	2
The N_1 ... a N_2 (Passives)	44	5	42	6	2	1
A N_1 ... the N_2 (Actives)	33	5	44	14	3	1
A N_1 ... the N_2 (Passives)	36	3	45	11	5	0

Note. "ΔN_2" designates a response in which N_2 of the given sentence was changed; "ΔVN_2" designates one in which both the verb and N_2 was changed; etc.